## **Subject Index**

Acetate, see also 12-0-Tetradecanovlphorbol-13-acetate cyproterone, 365, 389 phorbol myristyl, 245 Acid, see also Cycle hyaluronic, 474 retinoic, 355, 370 Activity collagenolytic, 281 gelatinolytic, 287 intracellular transglutaminase, 89, 94 Adhesion, see also Molecule focal, 245 Agglutinin, peanut (PNA), 264, 267 Agouti, 409, 419, 420, 423, 425 Alopecia androgenetic (AGA), 107, 376 macaque, 108 Alopecia areata, 476, 478, 487 Anagen, 1, 22, 23, 108, 148, 216, 238, 244, 247, 253, 256, 329, 348, 350, 431, 487, 493 Analyses, complementation, 422 Androgen, see also Antiandrogen, 116, 355, 356, 358, 361, 372, 385, 432 Androstenedione (AD), 361, 365, 376, 387, 452 Antiandrogen, 107 Antigen, bullous pemphigoid, 136, 137 Ap-1, 8, 12 AP-2, 8, 12 Apoptosis, 300, 487 Aromatose, 376 Autoradiography, [3H]thymidine, 152

Baldness, 107
Body, intranuclear (INB), 442
Box
CAAT, 8, 10
TATA, 8
5-Bromodeoxyuridine, 108
Bud, feather, 352
Bulb, 1, 198, 227, 350
Bulge, 1, 198, 216, 219, 224, 431, 432, 496

Cadherins, 263 Calcyclin, 23, 27, 31 Calmodulin, 69 Carcinogenesis, skin, 220 Carcinoma, basal cell, 197 Catagen, 1, 23, 108, 148, 216, 237, 244. 247, 253, 255, 256, 257, 259, 291, 329, 431, 487, 493 cDNA library, hair, 33 Cell basal, see also Carcinoma nonserrated, 215 cortical, 12, 483 dermal papilla (DP), see also Papilla, 173, 174, 232, 235, 249, 269, 355, 362, 368, 385, 386, 388, 392, 436, 439, 442, 452 in cultures, 249, 255 dermal sheath, 229, 433 epidermal, 236 follicle stem, 1, 176 germinative matrix, 237 hair follicle epidermal, 236 hair matrix-derived, 126 hair papilla, 446 inner root sheath, 503 label-retaining (LRC), 215, 216, 224, 247 Langerhan's, 293, 490 matrix, 503 mesenchymal, 253, 344 natural cytotoxic, 297 orthocortical, 4, 72 outer root sheath, 385, 388, 392, 454 papilla, 230, 236, 433 paracortical, 4, 72 pelage papilla, 232, 235 precortex, 342 stem, 77, 197, 209, 214, 251, 431 corneal epithelial, 215 hair follicle, 216, 219, 247 sebaceous, 224 transiently amplifying (TA), 1, 214 vibrissa papilla, 235 Cell types, immune, 493 Central nervous system, 348 Channel, potassium, 504 Chloramphenicol acetyltransferase (CAT), Chondroitin, unsulfated (COS), 257, 297 Chondroitin-6-sulphate (C6S), 247, 257,

297

Chromosomal localization, 32

Citrulline, 59, 64, 66 Coculture, 454 Collagen, 257 type I, 254, 436 type I, gel, 454 type III, 254, 436 type IV, 136, 137, 244, 249, 255, 436, 437 [3H]Collagen, 286 Collagenase, 286 Collagenase IV, 287 Complex major histocompatibility (MHC) class I, 291, 297, 493, 494 class II, 293, 494 peptide copper, 468 Cone, hair, 309 Contact, heterotypic cell, 310 Control, immunological, 494 Corpuscles, Hassall's, 56 Cortex, hair, 1, 4, 5, 10, 44, 64 Cromakalim, 504 Culture raft organ, 177 suspension organ (SOC), 167, 181 Cuticle, hair, 1, 4, 10, 44, 45, 48, 49 Cycle follicle, 226 hair growth, 214, 243, 256, 493 tricarboxylic acid, 301 Cyst, infundibular, 496 Cytoskeleton, 197

Day length, 356 Dehydroepiandrosterone (DHEA), 376 Deiminase, 76 arginine, 66 peptidylarginine, 59, 66 Dermomyotome, 348 Desmin, 32 Diazoxide, 113, 504 Diet, 72 Diffraction, X-ray, 491 Dihydrotestosterone (DHT), 376, 385, 386 5α-Dihydrotestosterone, 360, 365, 372, 452 Diphosphate, adenosine, 465 Dopaguinone, 396 Drosophila melanogaster, 346 Duct, sebaceous, see also Gland, 202

Electrophoresis, pulsed-field gel, 425 Embryogenesis, 167, 348, 370 β-Endorphin, 459 Entactin, 244 Envelope, cornified, 44, 46-49, 82, 103 Enzyme, cytochrome P-450 aromatose, 377 Epidermis, see also Cell, Interaction, Junction, Keratinocyte, Lineages, 202, 214, 221, 308 suprabasal, 205 Epithelium, see also Gut, Interaction, Junction, Tooth corneal, 214 germinative, 236 limbal, 215 palm, 434 Estradiol, 365 Estrogen, 383 Eumelanin, 396, 401, 419, 421 Exon, 8 Expression, hair keratin gene, 8

Pactor angiogenesis, 465 growth, see also Growth factor, 328 transcription, 8, 327 Feather, see also Bud, Morphogenesis, 263, 347, 462 Feminization, testicular, 360 Fiber, hair, 1 Fibroblast dermal, 311 dermal papilla, 501 human dermal (HDF), 139 reticular dermal, 386 Fibronectin, 244, 245, 252, 253, 257, 264, 465 Filaggrin, 52, 55, 60, 64, 71, 136, 137 Filaments, intermediate, see also Gene, 197 Follicle, see also Morphogenesis anagen, terminal-sized, 111 eyelash, 216 hair, 214-215 isolated human hair, 152 pelage, 239 rat vibrissa, 253 telogen, vellus, 111 terminal, 107, 359, 361 vellus, 107, 359, 361 vibrissa, 237, 239 Folliculogram, 107, 108 Folliculoid, 455 Footpad, 232

Gel, see also Electropheresis collagen, 132 Gene decapentaplegic (DPP), 339

Foreskin, neonatal, 56

Hox 3.1, 346-348 Hox 5.2, 462 keratin, 1, 4, 32 cuticle, 8, 10 hair, 12-14 high-glycine/tyrosine (HGT), 16 high-sulfur (HS), 16 intermediate filament (IF), 5 type I, 10 type II, 12 locus Krt-1, 33, 37, 39 locus Krt-2, 33, 36, 38, 39 type Ib, 40 type IIb, "soft," 38, 40 ultrahigh-sulfur (UHS), 16 MHKB-1 and MHKB-2, 39 neurofilament, 32 polyoma virus large T, 441 trichohyalin, 1, 67 Germ, secondary, 291 Gland, sebaceous, see also Unit, 202, 207, 221, 314, 432 Glucose, 301 Glutamine, 303 Glycolysis, aerobic, 301 Glycoprotein, 243 surface, GP80, 136, 137 Glycosaminoglycan (GAG), 257, 446, 473 heparan sulfate, 246 sulfated, 474 Glycosylation, 396, 403 Gradient, calcium, 503 Granule cystine-rich, 4 inner root sheath, 65 trichohyalin, 51, 54 trichohyalin-keratohyalin hybrid, 60 Growth factor epidermal (EGF), 153, 157, 263, 283, 286, 311, 314, 315, 328, 329 receptors (EGF-R), 314, 315 fibroblast (FGF), 311, 315, 329 basic (bFGF), 318, 328, 336 insulinlike (IGF)-1, 155, 157, 311 nerve (NGFr), 169, 174 platelet-derived (PDGF), 465 PDGF-α, 174 PDGF-β, 174 PDGF BB, 269 transforming (TFG) TGF-a, 154, 283, 284, 287, 311, 315, 328, 329 TGF-8, 284, 311, 339, 465 TGF-\$1, 154, 157, 283, 328, 329, 339 TGF-82, 283, 287, 329 TGF-63, 329, 336 Gut, epithelia of, 174

Hair exclamation mark (EMH), 483 nonmedullated, 5 pelage, 216, 229 terminal, 480 Hands, E-F, 69 Hemidesmosomes, 256 Heparin, 257 Histoculture, 506 Homeobox, see also Protein, 346 Homeoprotein, 462 Hormone growth, 356 melanocyte-stimulating (MSH), 356 MSH-β, 459 thyroid, 356 Hyaluronan, 446 Hyperkeratosis, epidermolytic, 58 Hyperproliferation, 208 Hypothalmus-pituitary axis, 356 Hypothesis, bulge activation, 219

Immunology, 291
Induction, 167, 226, 236, 308
Inhibitor, plasminogin activator, 465
Integrin, 245, 252, 269
cellular, 257
Interaction, see also Junction
dermal-epidermal, 226, 230, 234
epithelial-mesenchymal, 167, 339, 350,
370
Intron, 2, 8
Involucrin, 10, 47, 134, 137
Isthmus, 198, 208

Junction dermal papilla-epithelial, 476 epidermal-mesenchymal, 309, 318

Keratin, 1 hard 32 ultrahigh-sulfur, see also Gene, 500 Keratin 1 (K1), 103, 128, 134, 205 K4, 205 K5, 103, 128 K6, see also Polypeptide, 128, 282 K7, 202, 205 K8, 200 K9, 128, 434 K10, 103, 128, 134, 137, 205 K11, 137 K13, 128, 205 K14, 103, 128, 202, 282, 284

in vitro, 148

Keratin 1 (K1) (continued)
K16, see also Polypeptide, 128, 134, 137, 202, 208
K17, 128, 205, 208
K18, 200
K19, 205, 208
Keratinocyte cortical, 1 cuticle, 1 epidermal, 311 hair, 4 precortical, 483
Keratohyalin, 52
Keratosis actinic, 58

Lactate, 301
Laminin, 136, 137, 244, 249, 255, 437
Lanthanum, 503
Layer, granular, 58
Layers of Henle and Huxley, 202, 207
[U-¹⁴C]Leucine, 155
Limbs, 353
Lineages, epidermal cell, 175
ε(γ-glutamyl) Lysine, 82

lichen planus-like, 58

Vacaque, stumptailed, 107 Macrophage, 293 Matrigel, 139 Matrix, see also Cell, 148 collagen gel, 454 extracellular (ECM), 253 dermal papilla, 257 Medula, see also Hair, 1, 54, 64, 66, 69, 76 Melanocyte, 361, 396, 419, 420, 487 Melatonin, 356 Membrane basement, 243, 244, 246, 247, 252, 255, 256 glassy, 238, 255, 256 Mesenchyme, see also Interaction, 173, 235, Mesoderm feather, 462 somitic, 348 Metabolism, intermediary, 301 Metalloproteinases, 287 [35S]Methionine, 152 [3H]Mibolerone, 364, 365 Minoxidil (MNX), 25, 107, 111, 116, 120, 156, 157, 465, 466, 470, 473, 500 Model

quantitative, 107 Molecule intercellular adhesion (I-CAM)-1, 190 liver cell adhesion (L-CAM), 263, 264 neural cell adhesion (N-CAM), 196, 174, 263, 264, 269 Morphogenesis, 339 feather, 252 follicle, 168, 173, 176 whisker, 340 Motif DNA sequence, 8 octamer, 10 regulatory, 8 Mouse albino, 407 nude, 480, 508 transgenic, 12-14, 21, 407, 500 Mutant, agouti, 421

Nail, 56 Necrosis, 487 Nicorandil, 504 Nonserration, 215 Nutrition, 72

Obesity, 421 Oncogene cdc2, 328 c-myc, 326–328 N-myc, 326, 327, 329, 331, 336 viral, 439

Pancornulins, 47 Papilla, 310 dental, 230 dermal, see also Cell, Interaction, Junction, 148, 226-228, 233, 243, 247, 253-255, 257, 309, 350, 361, 372, 431, 432, 448, 454, 478, 496 Pathways, glycolytic, 301 Patterning, 346 Peg, hair, 207 Pelage, see also Hair, 235, 433 Phaeomelanin, 396, 401-402, 419, 421 Pinacidil, 504 Platelet factor 4, 465 Polymerase chain reaction (PCR), 347 Polypeptide, keratin, K6 and K16, 60 Product, trans-acting, 420 Prolactin, 356 Pro-opiomelanocortin, 459

Protein bone morphogenetic (BMP), 340 BMP-2, 342 BMP-4, 340, 344 Ca++ binding, 21 decapentaplegic-Vg-bone morphogenic (DPP-Vg-BMP) gene family, 339 glial fibrillary acidic, 32 homeobox, see also Homeoprotein, 353 intermediate filament (IF), 2, 4, 5, 10, 14, intermediate filament associated (IFAP), 2, 14, 64, 69 keratin, 2 high-glycine/tyrosine (HGT), 2, 5, 8, 14, 71, 74 high-sulfur (HS), 2, 5, 14, 71, 74 ultrahigh-sulfur (UHS), 2, 4, 5, 10, 14, 21, 22, 71, 74 serine-rich, 23, 27 keratin-associated, 51 matrix, 252 S100-like, 69 Protein kinase C, 245 Proteoglycan, 243, 245, 252, 297 chondroitin sulfate (CSPG), 247, 253, 257, 437 basement membrane (BM-CSPG), heparan sulfate (HSPG), 257 Protooncogene myc, 326 max, 327 Provirus, ecotropic (Emv-15), 423 Pseudoallele, 422 Psoriasis, 58

Kat, fuzzy, 118 Receptor androgen, 360, 364, 372, 431, 432, 448 retinoic acid (RAR), 369 RAR-β, 370 RAR-y, 370 Recombinants, 309 Recombination, homologous, 77 5α-Reductase, see also Syndrome, 360, 385, 392, 452 Region, E1A, 441 Regulation, transcriptional and translational, Repeats, heptad, 66 Retrotransposon, 423 Rhythm, circadian and circannual, 431 Ringwulst, 216 Rodlet, intranuclear (INR), 442

Sciellin, 47, 48 Sequence, promoter, 8 Serration, 215 Shaft, hair, 198 Sheath, see also Cell connective tissue, 148, 253, 254, 257 dermal (DS), 227, 235 inner root (IRS), 47, 48, 51, 54, 64, 69, 76, 202, 205, 207, 309 outer root (ORS), 48, 126, 134, 139, 148, 197, 198, 200, 202, 205, 216, 219, 230, 236, 243, 309, 310 epidermal, 227 root, 1 Sinus, ring, 216 Spheroids, 139 Stratum corneum, 44 lower, 58 Strength, tensile, 491 Structure helix-turn-helix, 69 leucine zipper, 327 chondroitin, 264, 446, 474 dermatan (DS), 257, 297, 446 heparan, 446 minoxidil (MNX), 470, 504 Sulfotransferase, 474 Supernatant, activated platelet (APST), 465 Suppressor, agouti, 422 Syndrome, 5-\alpha-reductase deficiency, 375 System, second messenger, 246

elogen, 1, 23, 108, 148, 216, 227, 237, 239, 244, 247, 253, 255-257, 329, 431, 432, 487 Temperature, 356 Tenascin, 174, 263, 264, 269 Testosterone (T), 356, 360, 365, 372, 376, 385, 386, 388, 452 [3H]Testosterone, 362 12-O-Tetradecanoylphorbol-13-acetate (TPA), 155, 157, 215 β-Thromboglobulin, 465 [3H]Thymidine, 108 Tongue, dorsal, filiform papillae of, 55 Tooth, 230 epithelia of, 174 Toxin, cholera, 287 Transcription, gene, 8 Transformation, dark cell (DCT), 487 Transglutaminase, see also Activity, 59, 66, 76, 82 C, 83, 96

E, 83-85, 90, 92

- Transglutaminase (cont.) K, 83, 89, 91 Tretinoin, 121 Trichocytes, 197 Trichohyalin, 51, 52, 55, 64, 65, 69, 76, 505
- Trichorrhexis nodosa, 44 Trichothiodystrophy, 44 Tunicamycin, 399 Tyrosinase, 396, 398, 407 glycosylated, 399
- Unit, pilosebaceous, 376
- Vector, retroviral, 441 Vellus, see also Follicle, 432

- Vg-1, 339 Vg-related-1 (Vgr-1), 340, 342 Vibrissa, *see also* Follicle, 22, 214, 216, 226, 229, 230, 433, 503 Vimentin, 32
- Wulst, 198, 205, 208
- X-linked hypohidrotic ED (X-LHED), 191 XIHbox 1, 462
- Zone basement membrane, 257 keratogenous, 21

